REMARKS/ARGUMENTS

Claims 1-7 are pending. By this Amendment, new claim 7 is presented. Support for new claim 7 can be found, for example, in the present specification at page 18, lines 1 to 10 and page 21, Table 2, and in original claim 4. No new matter is added. In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

Rejection Under 35 U.S.C. §103

The Office Action rejects claims 1-6 under 35 U.S.C. §103(a) over U.S. Patent No. 6,338,763 to Hashimura et al. ("Hashimura") in view of "Fracture Toughness Properties – Effects of Microstructure and Heat Treatment," from *Metals Handbook Desk Edition* ("Metals Handbook"). Applicants respectfully traverse the rejection.

Claim 1 recites "[a] steel wire for a high-strength spring having superior workability, the steel wire comprising tempered martensite, and comprising by mass: C: 0.53 to 0.68%; Si: 1.2 to 2.5%; Mn: 0.2 to 1.5%; Cr: 1.4 to 2.5%; Al: 0.05% or less, excluding 0%; at least one member selected from the group consisting of Ni: 0.4% or less, excluding 0%; V: 0.4% or less, excluding 0%; Mo: 0.05 to 0.5%; and Nb: 0.05 to 0.5%; and a remainder consisting essentially of Fe and inevitable impurities; wherein: the steel wire has a prior austenite grain size number of 11.0 or larger; and a ratio ($\sigma_{0.2}/\sigma_B$) of 0.2% proof stress ($\sigma_{0.2}$) to tensile strength (σ_B) in the steel wire is 0.85 or lower." Hashimura and Metals Handbook do not disclose or suggest such a wire.

Applicants previously argued that one of ordinary skill in the art would have had no reason to expect that the steel of Hashimura would have desirable resistance to fatigue cracking if modified to increase the prior austenite grain size number. In response, the Office Action asserts that, *inter alia*:

> ... one of ordinary skill in the art would have been motivated to minimize the prior austenite grain size as much as possible to avoid a detrimental effect on resistance to fatigue cracking of the steel wire for a high-strength spring of Hashimura. It would have been obvious to one of ordinary skill in the art to optimize the prior austenite grain size through routine experimentation in order to achieve a desired amount of resistance to fatigue cracking of the steel.

See Office Action, page 6. Applicants have conducted experimentation, which is set forth in the Declaration Under 37 C.F.R. §1.132 ("Declaration") attached hereto, to demonstrate that the Office Action's assumptions about whether and how one of ordinary skill in the art would have modified the steel of Hashimura are incorrect.

In particular, Applicants prepared a steel composition according to Hashimura, which was modified to have a prior austenite grain size of 12.0. *See* Declaration, paragraph 4(I). That is, Applicants prepared a steel composition that is even closer to the steel composition of claim 1 than the steel compositions of Hashimura to show that one of ordinary skill in the art would not have expected that decreasing prior austenite grain size would improve fatigue resistance. *See* MPEP §716.02(e) (citing *In re Holladay*, 199 USPQ 516 (CCPA 1978)) (Applicants may compare the claimed invention with prior art that is more closely related to the invention than the prior art relied upon by the examiner).

As indicated above, the Office Action has taken the position that it would have been obvious to reduce the prior austenite grain size to improve fatigue resistance. However, the results in the Declaration demonstrate that a steel composition according to Hashimura modified to have a prior austenite grain size as recited in claim 1 yields springs having a far inferior fatigue life in comparison to springs obtained from steel compositions as recited in claim 1. *See* Declaration, paragraphs (4)(I) and (4)(II); present specification, page 21, Table 2. Thus, routine testing of type shown in the Declaration confirms that a skilled artisan would not reasonably expect that merely modifying prior austenite grain size would improve

resistance to fatigue – one of ordinary skill in the art would not have been motivated to modify the steel compositions of Hashimura as proposed in the Office Action.

As one of ordinary skill in the art would have had no reason to expect that the steel of Hashimura would have desirable resistance to fatigue cracking if modified to increase the prior austenite grain size number, a *prima facie* case of obviousness has not been made.

As explained, claim 1 would not have been rendered obvious by Hashimura. Claims 2-6 depend from claim 1 and, thus, also would not have been rendered obvious by Hashimura. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Double Patenting

The Office Action provisionally rejects claims 1 and 2 under the judicially created doctrine of obviousness-type double patenting over claims 1-4 of U.S. Patent Application No. 10/550,019 in view of Metals Handbook. Applicants submit that it may be appropriate to withdraw the provisional rejection when the present application is otherwise in condition for allowance, pursuant to MPEP §§ 804, 822.01. When a determination is made as to whether the provisional rejection is to be withdrawn, Applicants will file a Terminal Disclaimer or take other appropriate action, if necessary.

New Claim

By this Amendment, new claim 7 is presented. New claim 7 depends from claim 1 and, thus, is believed to be patentable for at least the reasons discussed above with respect to claim 1. Moreover, Applicants note that the experimental results in the Declaration discussed above demonstrate that springs formed from the steel compositions of Hashimura, even if

modified to have the prior austenite grain size of claim 1, do not necessary have the fatigue strength recited in claim 7.

Conclusion

For the foregoing reasons, Applicants submit that claims 1-7 are in condition for allowance. Prompt reconsideration and allowance are respectfully requested.

Respectfully submitted,

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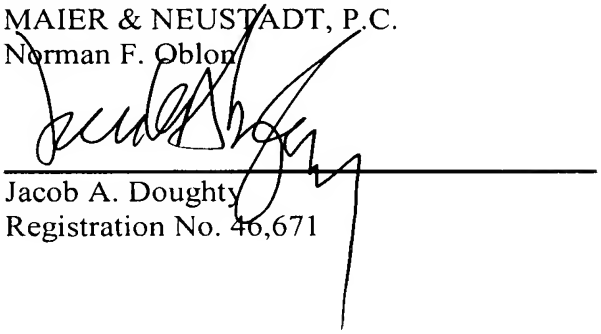

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Attachments:
Declaration Under 37 C.F.R. §1.132